Common (and serious) Algebra Errors

Terms vs. Factor errors

Many properties apply only to terms or only to factors. Be clear on which is which.

$(ab)^n = a^n b^n$ but $(a+b)^n \neq a^n + b^n$

powers do not "distribute over addition"

$\sqrt{ab} = \sqrt{a}\sqrt{b}$ but $\sqrt{a+b} \neq \sqrt{a} + \sqrt{b}$

cannot "take root term by term"

$\frac{3a^{-2}b}{c} = \frac{3b}{a^2 c}$ but $\frac{3a^{-2}+b}{c} \neq \frac{3+b}{a^2 c}$

factors "jump fraction bar" to change sign of exponent — terms do not

$\frac{2xy}{5x} = \frac{2\cancel{x}y}{5\cancel{x}} = \frac{2y}{5}$ but $\frac{2x+y}{5x} \neq \frac{2\cancel{x}+y}{5\cancel{x}}$

factors divide out — terms do not "cancel"

3(x+y)=3x+3y
"multiplication distributes over addition"

$10(0.2x) \neq 10(0.2) \bullet 10x$
but mult does not "distribute over mult"
instead, the associative law applies
$10(0.2x) = (10 \bullet 0.2)x = 2x$

Missing or "invisible" parenthesis

$(-3)^2 = (-3)(-3) = 9$ but $-3^2 = -(3)^2 = -(3 \bullet 3) = -9$

$(5x)^{-2} = \frac{1}{(5x)^2} = \frac{1}{25x^2}$ but $5x^{-2} = 5 \bullet x^{-2} = 5 \bullet \frac{1}{x^2} = \frac{5}{x^2}$